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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	: 10/662,465	Confirmation No.	9622
Applicant	: Shiquan Wu et al.		
Filed	: September 16, 2003		
TC/A.U.	: 2416		
Examiner	: Mohammad Sajid Adhami		
Docket No.	: 77682-510		
Customer No.	: 07380		

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Commissioner for Patents
Alexandria, VA 22313-1450
U.S.A.

Dear Sir:

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Applicant requests review of the rejections set out in the Final Office Action dated November 8, 2009 in connection with the above-identified application. A Notice of Appeal has been submitted concurrently herewith.

Claim Rejections – 35 U.S.C. § 102

In paragraph 2 of the Final Action, the Examiner continues to reject claims 1, 2, 9, 15, 54, 55, 71, 79 and 80 under 35 U.S.C. 102(a) as being anticipated by Witschnig ("A Different Look on Cyclic Prefix for SC/FDE" Personal, Indoor and Mobile Radio Communications, 20002. The 13th IEEE International Symposium ON, col. 2 15-18 Spet. 2002, pages 824-828 referred to as Witschnig).

It is important to understand that Witschnig contains a discussion and some details of two different systems. The first is OFDM (Orthogonal Frequency Division Multiplexing). OFDM typically involves the performance of an IFFT (Inverse Fast Fourier Transform) at the transmitter that converts frequency domain signals to time domain for transmission. At the receiver, a corresponding FFT is performed to bring the samples back into the frequency domain. A discussion of the OFDM approach is described in the second paragraph of Section I of Witschnig:

> One of the major advantages of OFDM (Orthogonal Frequency Division Multiplexing) is its capability of using low complexity frequency domain equalization instead of costly time-discrete convolution operations. This advantage is gained at the expense of a cyclic prefix (CP), which is necessary to cope with time dispersive channels. The equalization complexity of the FFT based OFDM concept grows slightly faster than linearly with the bit rate.

The second system referred to is SC/FDE (Single Carrier/Frequency Domain Equalization). SC/FDE does not employ OFDM, but rather a single carrier transmission is made. However, at the receiver, an FFT is performed to convert a time domain signal to a frequency domain signal. Then, frequency domain equalization is performed and an IFFT is performed to convert the samples back to the time domain. See Figure 1 which contains a block diagram of an SC/FDE system.

It should be very clear to a person skilled in the art that an OFDM system is not the same as an SC/FDE system, and the Examiner has not alleged this to be the case.

In the Examiner's rejections, the Examiner has picked and chosen features of the described OFDM system and features of the described SC/FDE system. It should be readily apparent that this cannot form the basis for a proper 35 U.S.C. 102(e) rejection.

The Pre-Appeal Brief Review Panel is referred to Applicant's preceding response dated

June 18, 2009 for a detailed discussion.

At this time, Applicant will address the "Response to Arguments" section of the Final Office Action. The Examiner argued the following:

> In the remarks, Applicant contends "Witschnig does not disclose transmitting an OFDM signal". Witschnig does disclose transmitting an OFDM signal (Fig. 1 ref. Transmitter and fig. 2 and Fig. 3 is an OFDM unit and Section IIIB the structure of a transmitted block, which consist of the original data sequence of N symbols and the sequence of the UW with N symbols).

The Examiner seems to have a lack of understanding of OFDM. Figure 1 is clearly not an OFDM transmitter. There is no IFFT function. A single carrier transmission is performed. Figure 2 is a block diagram of the transmitted data structure. The Examiner refers to an OFDM unit being taught in this figure. However, this again is simply not the case. This is referring to the signals transmitted by the transmitter of Figure 1. The T_{FFT} is a time duration used by the FFT function in the receiver. The FFT is performed to allow frequency domain equalization. However, there is no IFFT operation that takes place in the transmitter. Figure 3 shows a time domain sequence with a unique word appended to yield an overall sequence that has a duration of T_{FFT}=NT. Again, this is a transmitted word that is transmitted on a single carrier by the transmitter. FFT operations are performed in the receiver. The sequence per se is never subjected to an IFFT in a transmitter.

The Examiner goes on to argue:

> Although Witschnig may focus on SC/FDE, it still discloses transmitting an OFDM signal. The discussion of SC/FDE is in relation to techniques used with OFDM (Section V the adoption of techniques initially associated with OFDM). The mention of these techniques also fulfils the teachings of OFDM.

There is no logic to this statement. The reference teaches you the use of a cyclic prefix in OFDM. See the second paragraph of Section I. This paragraph in fact discusses the disadvantages of such a cyclic prefix. This approach of using a cyclic prefix has been applied in SC/FDE system. However, there is nothing in Witschnig to suggest the use of a unique word such as contemplated in Witschnig for SC/FDE in place of a cyclic prefix would be appropriate for an OFDM system. This is simply not the subject of the paper. All references to OFDM in the entire paper are in the context of using a cyclic prefix, the very thing that Applicant's are seeking to avoid.

The Examiner goes on to argue that:

> Furthermore, section IV mentions "Methods that are not based on special sequences were developed for OFDM and can be implemented for SC/FDE too".

It is noted that this section is in the context of synchronization and channel estimation. There nothing here that suggests that a cyclic prefix is not necessary in an OFDM system.

Another distinction that is worth highlighting is that the independent claims refer to transmitting an OFDM transmission unit that comprise OFDM symbols, and in addition, non-OFDM segments containing the known data and/or unknown highly reliable data. Thus there are two different types of signal transmitted namely OFDM and non-OFDM. The Examiner has not addressed this.

It should be clear that the signal transmitted in the system of Figure 3 fails on a number of counts to satisfy the claim limitations:

a) as discussed in detail above, no portion of the transmitted signal is an OFDM signal;

b) the signal transmitted is all of the same format namely a time domain signal in the form of a sequence of bits. It can be seen from Figure 3 that the unique word is of the same

format and signal type as the main signal. Technically speaking, the entire transmission of Figure 3 is a "non-OFDM" transmission. In any event there is clearly not two different types of signals that are transmitted in the system of Figure 3.

On these bases, it is respectfully submitted that the Examiner has very clearly erred in rejecting claim 1 under 35 U.S.C. 102.

Regarding claims 2 and 55, given that Witschnig does not disclose the transmission of a signal containing OFDM symbols and a non-OFDM segment, it should be readily apparent that Witcshnig does not contain any discussion of the length of non-OFDM segments compared to OFDM symbols.

The remaining claims are rejected under 35 U.S.C. 103(a) as being unpatentable over Witschnig in view various other references. The other references do not address the deficiencies of Witschnig detailed above and as such these claims should also be clearly patentable.

In summary, it is respectfully submitted that all of the lack of novelty and obviousness rejections are clearly erroneous and should be withdrawn.

Respectfully submitted,

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Date: November 9, 2009

RAB:rld